

## Image Processing

Subject Code: <b>06EC756</b>	IA Marks : 25
No. of Lecture Hrs/Week : 04	Exam Hours : 03
Total no. of Lecture Hrs. : 52	Exam Marks : 100

### PART - A

#### Unit - 1

**Digital Image Fundamentals:** What is Digital Image Processing, fundamental Steps in Digital Image Processing, Components of an Image processing system, elements of Visual Perception **6 Hours**

#### Unit - 2

Image Sensing and Acquisition, Image Sampling and Quantization, Some Basic Relationships between Pixels, Linear and Nonlinear Operations. **6 Hours**

#### Unit - 3

**Image Transforms:** Two-dimensional orthogonal & unitary transforms, properties of unitary transforms, two dimensional discrete Fourier transform. **6 Hours**

#### Unit - 4

Discrete cosine transform, sine transform, Hadamard transform, Haar transform, Slant transform, KL transform

**6 Hours**

### PART - B

#### Unit - 5

**Image Enhancement:** Image Enhancement in Spatial domain, Some Basic Gray Level Transformations, Histogram Processing, Enhancement Using Arithmetic/Logic Operations. **6 Hours**

#### Unit - 6

Basics of Spatial Filtering Image enhancement in the Frequency Domain filters, Smoothing Frequency Domain filters, Sharpening Frequency Domain filters, homomorphic filtering. **6 Hours**

#### Unit - 7

Model of image degradation/restoration process, noise models, Restoration in the Presence of Noise, Only-Spatial Filtering Periodic Noise Reduction by Frequency Domain Filtering, Linear Position-Invariant Degradations, inverse filtering, minimum mean square error (Weiner) Filtering **10 Hours**

#### Unit - 8

Color Fundamentals. Color Models, Pseudo color Image Processing., processing basics of full color image processing

**6 Hours**

#### Text Book:

1. **“Digital Image Processing”**, Rafael C.Gonzalez and Richard E. Woods, Pearson Education, 2001, 2<sup>nd</sup> edition.

#### Reference Books:

1. **“Fundamentals of Digital Image Processing”**, Anil K. Jain, Pearson Edun, 2001.
2. **“Digital Image Processing and Analysis”**, B. Chanda and D. Dutta Majumdar, PHI, 2003.